

A colligate *Spirogyra* (Zygnemataceae, Zygnematophyceae) in Australia

Stephen Skinner and Timothy J. Entwisle

Botanic Gardens Trust Sydney, Mrs Macquaries Road, Sydney NSW 2000, Australia
email: stephen.skinner@rbgsyd.nsw.gov.au

Abstract

A species of *Spirogyra*, *Spirogyra yuin*, with external collar-like sleeves holding cells in filaments is described for the first time in Australian freshwater systems. Similar in form and dimensions to *S. silesiaca*, it is distinct in possessing an irregularly honeycombed mesospore wall and golden mesospore.

Introduction

No reports of colligate *Spirogyra* have been published for the southern hemisphere. In describing *Spirogyra colligata*, Hodgetts noted a 'most curious feature': the 'H shaped piece of membrane' between each touching pair of cells. 'This connecting-clamp is a thin cylindrical piece of cell-wall...' Hodgetts (1920). Hodgetts saw this taxon as unique in the genus. *Spirogyra colligata* with vegetative cells 29–40 µm diam. and lenticular zygospores with verrucose, golden brown mesospore walls is reported from Europe and North America (Kadlubowska 1984). Kadlubowska (1969) investigated further the connecting clamp, or collar, and amended Hodgetts' description to point out that the collar does not have a septum as described by Hodgetts but rather a furrow or band, and was completely detachable. Two further colligate taxa have been described for *Spirogyra*: *Spirogyra silesiaca* Kadl. has vegetative cells 43–52 µm diam., and lenticular zygospores with verrucose, brown mesospores, described from Poland (Kadlubowska 1967). *Spirogyra subcolligata* Bi has vegetative cells 37–41 µm diam., and smooth-walled, lenticular to ovoid zygospores, the mesospore wall quite thick, and sulcate, described from Huaiyang, China (Bi 1979).

Spirogyra yuin Skinner & Entwisle *sp. nov.*

Type: NSW: South Coast: Dry River, below bridge at Quaama, Skinner 0522, 2 Jan 2002 (holo NSW).

Spirogyrae silesiaca similis sed mesosporis bilaminatis, rugosis externe, et inaequaliter faveolatis atque aurcis interne.

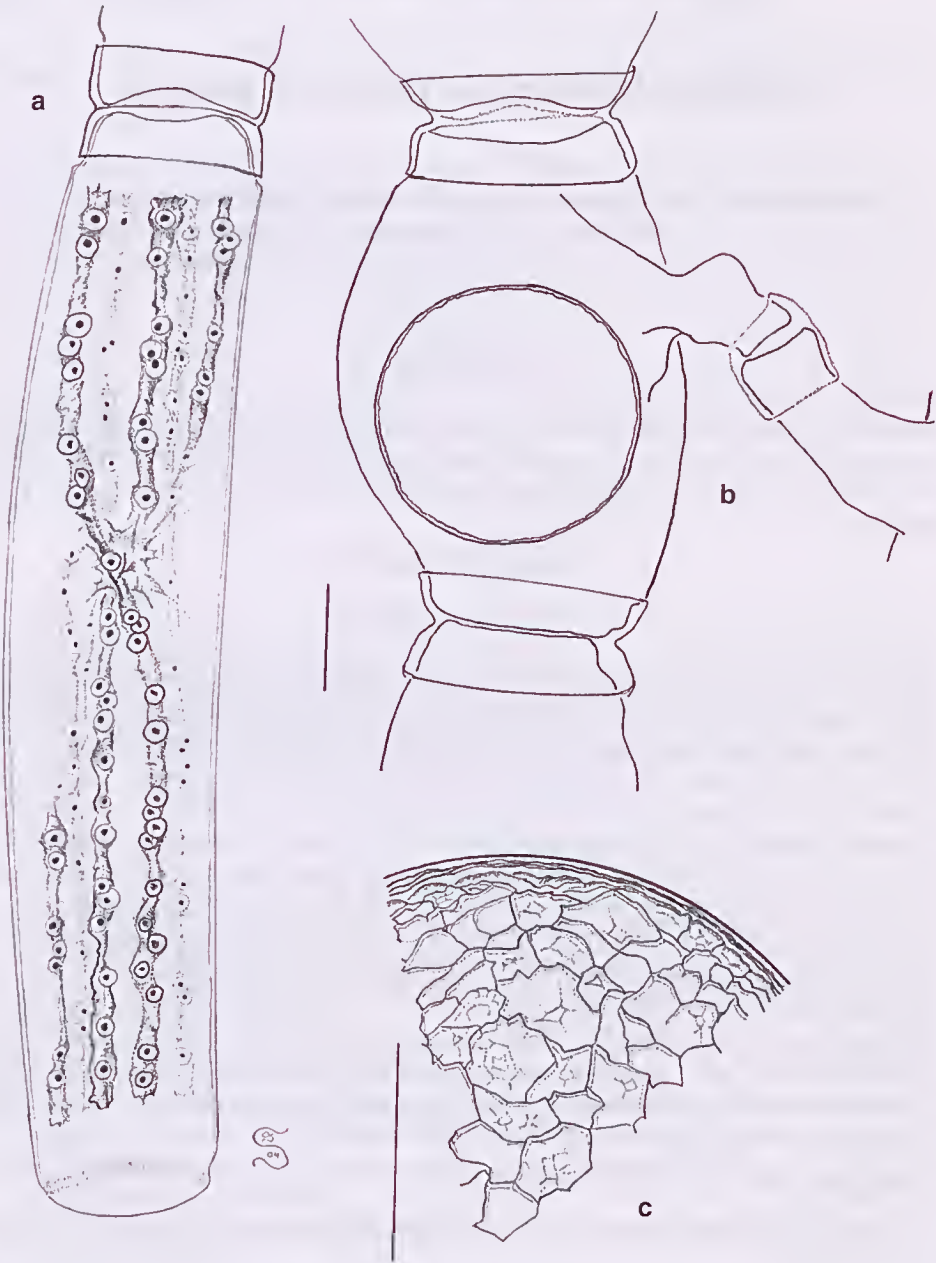


Fig. 1. a–c. *Spirogyra yuin*, Skinner 0522 (NSW). a, vegetative cell, with and without collar; b, receptor gametangium and sigmoid connecting tube; c, zygospore (part) with sculpturing. Scales 20 μ m.

Vegetative cells cylindrical, L/D 4.5–12, 45–50(–55) μm diam., end-wall colligate, chloroplasts ribbon-like, 4–5, straight or weakly spiralled; pyrenoids numerous, with wide starch haloes. Conjugation scalariform, occasionally terminal; donor cell as vegetative cells, receptor cell inflated ovoid in the middle of the cell, 79–95 μm across the inflation; conjugation tubes from both sides, cylindrical to vermiform, funnel ended with mucilage collar at junction, 23–27 μm diam. Zygospore lenticular, ovoid in side view, 68–82 μm diam., c. 50 μm thick, exospore smooth, clear, thin, mesospore two-layered, outer pearly, finely furrowed, inner wrinkled, honeycombed, golden yellow. Fig. 1 a–c.

Etymology: named in recognition of the Yuin people, the traditional owners of the area in which the collection was made and the river rises.

Distribution: New South Wales, in fluctuating river with cobblestone bed, endemic.

Specimen examined: New South Wales: South Coast: Dry R., below bridge at Quaama, *Skinner 0522*, 2 Jan 2002 (NSW).

While the specimens found at Quaama were similar to the published species in general form, and are closest to *S. silesiaca* in dimensions, the furrowed, irregularly honeycombed mesospore, golden in colour, is distinctive.

Acknowledgments

We thank Ms Alice Cheung for Chinese translations. Representatives of New South Wales south coast aboriginal peoples agreed to the use of the Yuin name.

References

- Bi Liejiu (1979) New Zygnemataceous algae from Henan Province. *Oceanologica Limnologia Sinica* 10: 354–361.
- Hodgetts WJ (1920) A new species of *Spirogyra*. *Annals of Botany* 34: 519–524, Pl. 22.
- Kadlubowska JZ (1967) *Spirogyra silesiaca* sp. n. *Fragmenta Floristica Geobotanica* 13: 163–164.
- Kadlubowska JZ (1969) Structure of cell-wall of *Spirogyra colligata* Hodgetts (1920) and changes of diagnosis of this species — Budowa ściany komórkowej *Spirogyra colligata* Hodgetts (1920) oraz zmiana diagnozy tego gatunku. *Fragmenta Floristica Geobotanica* 15: 255–257.
- Kadlubowska JZ (1984) Chlorophyta VIII Conjugatophyceae I: Zygnemales *Süßwasserflora von Mitteleuropa* 16 (Gustav Fischer Verlag: Jena)

Manuscript received 16 February 2005, accepted 20 April 2005